

GP-302076

CLAIMS

What is claimed is:

1. A fuel cell system comprising:
a fuel cell stack, said fuel cell stack receiving a cathode input gas and a hydrogen anode input gas, said fuel cell stack exhausting a cathode exhaust gas on a cathode exhaust gas line and an anode exhaust gas on an anode exhaust gas line;
a purge valve coupled to the anode exhaust gas line for selectively purging the anode exhaust gas; and
an accumulator coupled to the anode exhaust gas line, said accumulator accumulating the purged anode exhaust gas from the purge valve.
2. The system according to claim 1 further comprising a bleed valve, said bleed valve selectively bleeding the anode exhaust gas accumulated in the accumulator.
3. The system according to claim 2 wherein the bleed valve bleeds the anode exhaust gas from the anode exhaust gas line at a slower rate than the purge valve purges the anode exhaust gas.
4. The system according to claim 2 wherein the bled anode exhaust gas from the bleed valve is combined with the cathode exhaust gas in the cathode exhaust gas line.
5. The system according to claim 4 wherein the combined anode and cathode exhaust gas is exhausted to the environment.
6. The system according to claim 2 wherein the bled anode exhaust gas is combined with the cathode input gas.

GP-302076

7. The system according to claim 2 wherein the bled anode exhaust gas is combined with the anode input gas.

8. The system according to claim 2 wherein the bleed valve is a spring-biased, solenoid controlled valve.

9. The system according to claim 2 wherein the bleed valve is at least one orifice.

10. The system according to claim 1 wherein the purge valve is a spring-biased, solenoid controlled valve.

11. The system according to claim 1 further comprising a pump, wherein the anode exhaust gas accumulated in the accumulator is combined with the anode input gas, and wherein the pump pumps the anode exhaust gas from the accumulator to an anode input to control the input pressure of the anode input gas.

12. The system according to claim 1 further comprising a controller, wherein the anode exhaust gas accumulated in the accumulator is combined with the anode input gas, and wherein the controller controls the operating pressure of the fuel cell stack to reduce the pressure of the fuel cell stack below the pressure of the anode exhaust gas in the accumulator.

13. The system according to claim 12 wherein the controller controls the pressure of the fuel cell stack in relation to the duty cycle of the purge valve.

GP-302076

14. A fuel cell system comprising:
 - a fuel cell, said fuel cell exhausting a cathode exhaust gas on a cathode exhaust gas line and an anode exhaust gas on an anode exhaust gas line;
 - an accumulator coupled to the anode exhaust gas line, said accumulator accumulating the anode exhaust gas; and
 - a bleed valve coupled to the anode exhaust gas line, said bleed valve selectively bleeding the anode exhaust gas accumulated in the accumulator.
15. The system according to claim 14 wherein the bleed valve is a spring-biased, solenoid controlled valve.
16. The system according to claim 14 wherein the bleed valve is at least one orifice..
17. The system according to claim 14 wherein the bled anode exhaust gas from the bleed valve is combined with the cathode exhaust gas in the cathode exhaust gas line.
18. The system according to claim 14 wherein the bled anode exhaust gas is combined with a cathode input gas.
19. The system according to claim 14 wherein the anode exhaust gas is combined with an anode input gas.
20. The system according to claim 19 further comprising a pump that pumps the anode exhaust gas from the accumulator to an anode input to control the input pressure of the anode input gas.
21. The system according to claim 19 further comprising a controller that controls the operating pressure of the fuel cell stack to reduce the

GP-302076

pressure of the fuel cell stack below the pressure of the anode exhaust gas in the accumulator.

22. A fuel cell system comprising:

a fuel cell stack, said fuel cell stack receiving a cathode input gas and a hydrogen anode input gas, said fuel cell stack exhausting a cathode exhaust gas on a cathode exhaust gas line and an anode exhaust gas on an anode exhaust gas line; and

an accumulator coupled to the anode exhaust gas line, said accumulator accumulating the anode exhaust gas from the stack.

23. The system according to claim 22 further comprising a pump that pumps the anode exhaust gas from the accumulator to an anode input to control the input pressure of the anode input gas.

24. The system according to claim 22 further comprising a controller, wherein the accumulated anode input gas is sent to an anode input to be combined with the anode input gas, said controller controlling the operating pressure of the fuel cell stack to reduce the pressure of the fuel cell stack below the pressure of the anode exhaust gas in the accumulator.

25. The system according to claim 24 further comprising a purge valve coupled to the anode exhaust gas line for selectively purging the anode exhaust gas to the accumulator, wherein the controller controls the pressure of the fuel cell stack in relation to the duty cycle of the purge valve.

26. A method of bleeding anode exhaust gas from a fuel cell system, said method comprising:

selectively purging the anode exhaust gas from a fuel cell stack through a purge valve;

accumulating the purged anode exhaust gas from the purge valve in an accumulator; and

GP-302076

selectively bleeding the anode exhaust gas accumulated by the accumulator through a bleed valve.

27. The method according to claim 26 wherein bleeding the anode exhaust gas includes bleeding the anode exhaust gas at a slower rate than purging the anode exhaust gas.

28. The method according to claim 26 further comprising combining the bled anode exhaust with the cathode exhaust gas.

29. The method according to claim 28 further comprising exhausting the combined anode and cathode exhaust gas to the environment.

30. The method according to claim 26 further comprising combining the bled anode exhaust gas with a cathode input gas applied to the fuel cell stack.